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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,596	04/30/2001	Cornelis Bernardus Aloysius Wouters	PHNL 000240	4795

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PHILIPS ELECTRONICS NORTH AMERICAN CORP
580 WHITE PLAINS RD
TARRYTOWN, NY 10591

EXAMINER

CHOI, WOO H

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 06/02/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/846,596

Applicant(s)

WOUTERS, CORNELIS
BERNARDUS ALOYSIUS

Examiner

Woo H. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9 and 11-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 1,3,7,9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 3, 7 and 9 are objected to because of the following informalities: The claims recite the limitation "said variety". While it can be understood that "said variety" refers to the "variety of block" it should be explicitly stated to make the claims clearer. "said variety" should be changed to "said variety of blocks." Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 – 3, 5 – 9, 11 – 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 7 recite the limitation "the limit value" and "the counters of the blocks" in the amended portion of the claims. There is insufficient antecedent basis for these limitations in the claims. Prior to the amendment, these limitations were found in claims that depended from claims 2 and 8, which provided the antecedent basis for these limitations. Incorporation of these limitations into the independent claims also creates very confusing claim language in claims 2 and 8 since "the limit value" and "the counters" are recited prior to "a limit value" and "an associated counter" in these claims.

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Claims 2, 3, 5, 6, 8, 9, 11, 12, and 13 are rejected for containing the deficiencies of their parent claims as discussed above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 – 3, 5 – 9, 11 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Assar *et al.* (PCT Publication No. WO 95/10083, hereinafter “Assar”).

6. With respect to claims 1, 7, and 13, Assar discloses a method of data management on a storage medium (figure 6, Flash Memory Device), the storage medium comprising a variety of blocks in which data can be stored, a first block from said variety of blocks being selected to execute a mutation on, characterized by determining whether the wear level of the first block is acceptable for executing the mutation, and if so, executing the mutation on the first block, and otherwise choosing from said variety a second block with a lower wear level than the first block, and copying the data of the second block to the first block (page 16, lines 19 – 29).

However, Assar does not specifically disclose that the limit value is increased when the majority of the counters of the blocks from said variety exceed the limit value. On the other

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hand Assar discloses a functionally equivalent method where the limit value is effectively increased (page 16, lines 19 – 31) by resetting the counters (see also figure 7, step 238). The limit values in Applicant's and Assar's inventions are used for wear leveling which is a mechanism used to ensure that all blocks are written to or erased fairly evenly. In both inventions, when an erasure count reaches a certain threshold, the data content of the block is swapped with one that is less frequently erased and the block that reached the threshold is not erased until the next wear leveling cycle. When the majority of block erasure counters reach the threshold (i.e. wear level is fairly even), the threshold is lifted, or increased, relative to the counters, so that the blocks can be erased (or written to) again and the wear leveling cycle begins anew. In Applicant's invention, the threshold value is increased by increasing the limit value while retaining the counter values. Assar's invention increases this threshold by maintaining the limit value while resetting (or decreasing) the counter values.

The difference between Assar and the claims is the method of increasing the threshold value relative to the counter values to start a new wear leveling cycle. However, this particular method of increasing the limit value while retaining the counter values, as opposed to retaining the limit value while resetting the counter values, does not have a disclosed purpose nor is it disclosed to overcome any deficiencies in the prior art. Accordingly, it would have been an obvious matter of design choice to use Assar's method to increase the threshold value relative to the counter values for new wear leveling cycle, since applicant has not disclosed that Applicant's method of increasing the threshold value relative to the counter values (or any other method of

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increasing the threshold value relative the counter values), overcomes a deficiency in the prior art or is for any stated purpose.

7. Claims 1 – 3, 5 – 9, 11 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Assar in view of Bruce *et al.* (US Patent No. 6,000,006, hereinafter “Bruce”).

With respect to claims 1, 7, and 13, Assar discloses a method of data management on a storage medium (figure 6, Flash Memory Device), the storage medium comprising a variety of blocks in which data can be stored, a first block from said variety of blocks being selected to execute a mutation on, characterized by determining whether the wear level of the first block is acceptable for executing the mutation, and if so, executing the mutation on the first block, and otherwise choosing from said variety a second block with a lower wear level than the first block, and copying the data of the second block to the first block (page 16, lines 19 – 29).

However, Assar does not specifically disclose that the limit value is increased when the majority of the counters of the blocks from said variety exceed the limit value. On the other hand, Bruce discloses a method of data management on a storage medium comprising a variety of blocks in which data can be store, where the limit value is increased when the majority of the counters of the blocks from the variety of blocks exceed the limit value (abstract, last 4 sentences, col. 9, lines 13 – 20)

It would have been obvious to one of ordinary skill in the art, having the teachings of Assar and Bruce before him at the time the invention was made, to use the threshold adjustment

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teachings of the flash memory storage system of Bruce, in the flash memory storage system of Assar, in order to minimize excess writes to flash memory while re-mapping address to pages of flash memory and be able to use a unified table for re-mapping, wear-leveling, and caching flash memories (Bruce, col. 2, lines 55 – 59).

8. With respect to claims 2 and 8, the method is characterized in that the blocks from said variety of blocks have an associated counter for counting the number of mutations in the block concerned, and that, when the value of the counter of the first block is smaller than a limit value, the value of the counter is increased and the mutation is executed, and otherwise a block of which the counter has a lower value than the counter of the first block is chosen as the second block (Assar, page 16, lines 20 – 25).

9. With respect to claims 3 and 9, the method is characterized in that the lower value is the lowest value of the values of the counters of the blocks from said variety (Assar, page 16, lines 22 – 25).

10. With respect to claims 5 and 12, the method is characterized in that the second block is erased after the data of the second block have been copied to the first block (this is inherent in flash memory store as the flash memory cells need to be erased before new information can be written).

11. With respect to claim 6, the method is characterized in that the mutation comprises erasing the first block (Assar, page 16, lines 22 – 25).

12. With respect to claim 11, the system is characterized in that the system is arranged for initially constructing a table in which the value of the counters of the blocks are stated (Assar, figure 9).

Response to Amendment

13. Specification has been amended to address objections. Corresponding objections are withdrawn.

Response to Arguments

14. Applicant's arguments with respect to claims 1 and 7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Assar's US Patent No. 5,485,595 is the US Patent that corresponds to the PCT Publication No. WO 95/10083.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Woo H. Choi whose telephone number is (703) 305-3845. The examiner can normally be reached on M-F, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (703) 305-3821. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

whc/MRK
whc
May 20, 2003


MATTHEW KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100